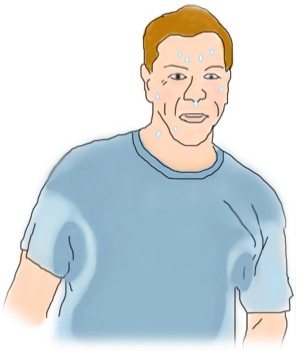
X-Plain™
Sympathectomy
Reference Summary

Introduction

It is estimated that about 1% of adults sweat excessively. Excessive sweating is a medical condition known as hyperhidrosis.



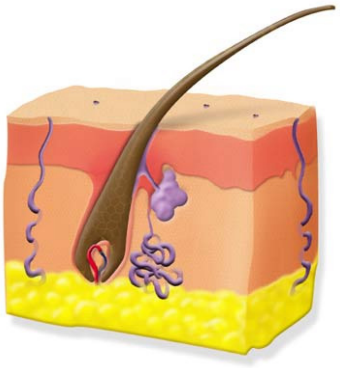
Your doctor may recommend surgery called sympathectomy to treat your hyperhidrosis. The decision to have this surgery is also yours.

This reference summary explains hyperhidrosis and sympathectomy. It discusses the causes of excessive sweating and its main treatment options. It then presents the benefits and risks of sympathectomy.

Sweating

Sweating, or perspiration, is a normal function of the body. It helps to cool the body when its temperature rises. That is why people sweat after exercising or when they are exposed to hot weather. People also sweat because of emotional stress.

Children and adults sweat. When a person reaches puberty, their body perspires more. The amount of sweat the body produces, however, does not decrease as a person gets older. In some people, excessive perspiration can occur. When this happens it is known as hyperhidrosis.



Sweat is made by sweat glands. There are millions of sweat glands in the skin of the body. Some areas have more sweat glands than others. These areas include: the skin of the hands, the feet, the armpits, and the groin area. Sweat is made up of water and salt and is mostly odorless. It usually becomes smelly when it mixes with bacteria on the skin

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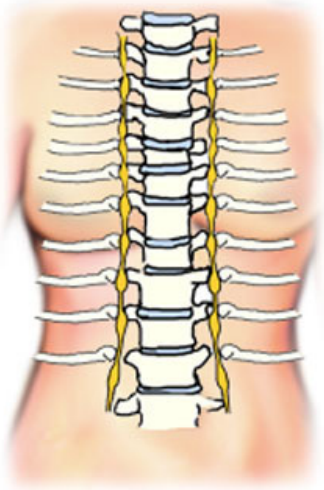
The body automatically controls perspiration to maintain normal body temperature. This is done by a special system of nerves called the sympathetic nervous system. Nerves in the sympathetic nervous system run from the brain to the spinal cord. From the spinal cord they spread out to the different areas of the body.

The sympathetic nervous system also controls a person's heart rate, blood pressure, and other involuntary bodily functions. Involuntary functions are functions of the body that work without a person thinking about them.



The sympathetic nerves that go to the hands come from two strands of nerves that are on either side of the spine. They start at the upper chest level.

When the armpits sweat too much it is known as axillary hyperhidrosis. When the palm of hands sweat too much it is called palmar hyperhidrosis. Plantar hyperhidrosis is when the soles of the feet sweat too much.

Symptoms

For most people, sweating is not a problem and deodorants can control the smell. However, people whose bodies create too much sweat may have a difficult time controlling perspiration. Because of this, people with hyperhidrosis may have a difficult time with some behaviors of normal social life.

Perspiration of the hands is known as palmar hyperhidrosis. For people with palmar hyperhidrosis, normal everyday activities, such as shaking hands, holding hands, or dancing can be stressful or embarrassing. Stress can make hyperhidrosis worse. Writing, using a keyboard or playing a musical instrument can be very difficult.

Patients with palmar hyperhidrosis may have to modify their behavior to get through normal daily activities. For example the patient may use pads to prevent ink from smearing when writing, or have napkins with them at all times. Patient's often need to change their undergarments and socks and may not be able to wear sandals or flip-flops.

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Palmar hyperhidrosis, or sweaty palms, is the most common type of hyperhidrosis, and the most socially upsetting. Sufferers fear any situation that may involve hand contact. This can interfere with one's ability to interact with others, and can have a negative impact on one's social life.

Embarrassing or difficult social situations are only one problem that hyperhidrosis can cause. Without regular washing and drying, fungal infections can develop. These fungal infections can cause a bad smell. Also, hyperhidrosis creates a higher risk of bacterial infections and heat rash. This is why people suffering from this condition need to pay extra attention to their hygiene.

Causes

The reason for hyperhidrosis in some people is unknown. However, hyperhidrosis can run in families.

Hormonal problems can cause the body to sweat too much. That is why it is important to check with your doctor if you start experiencing sudden sweating that is more than normal. It could be the sign of diabetes, overactive thyroid, or an infection.

Certain drugs, foods, and beverages can make people sweat more or make their sweat smell differently. When this causes the sweating, it can be controlled by changes in diet.

Alternative Treatments

Hyperhidrosis can be treated with medications, iontophoresis, and Botox® injections. Medications used to treat hyperhidrosis include Drysol® and Beta-blockers. Drysol is an anti-perspirant, which is made of aluminum chloride. It is put on the palms of the hands where it blocks the sweat ducts with aluminum salts. This causes less sweat to reach your skin.

If you have sweating all over your body, your doctor may prescribe an anticholinergic drug. Anticholinergics work by blocking the actions of acetylcholine. Acetylcholine is a chemical in your body that helps stimulate your sweat glands, making them produce more sweat. Signs and symptoms generally improve in about two weeks. But because acetylcholine is involved in many areas of your body, it can have various negative side effects.

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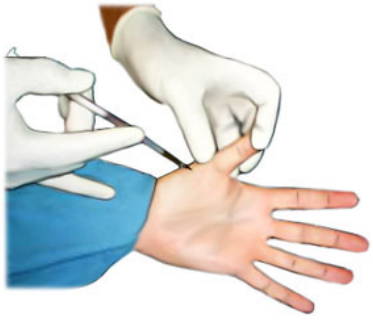
Iontophoresis is another treatment that has been proven to help. In this treatment, the hands and feet are separately put in a bath or tub of water. Electrical currents are sent through the water. The electrical current changes the way the sweat glands function and decreases how much sweat they create.

Iontophoresis usually requires several sessions, which can be as many as three times per week. Each session takes from 30 to 60 minutes. The amount of time depends on how many areas are being treated. This treatment can be somewhat inconvenient and tiresome. Watching television or reading during the treatment can help pass the time

Botox injections are another treatment option. Botox is the same product that helps smooth facial wrinkles. It does this by paralyzing certain muscles. Doctors have discovered that Botox injections are also an effective way to treat severe hyperhidrosis. It works by blocking the nerves that control the sweat glands. Botox injections have a temporary effect lasting up to four months. To control hyperhidrosis, patients will need Botox injections into their palms about every 4 months. This procedure is tolerable but is not the most comfortable.



When non-surgical treatments do not work to relieve palmar hyperhidrosis or when patients want a permanent solution, patients may need to consider surgical options. Sympathectomy is a surgery that is done to treat and control hyperhidrosis of the palms. In some cases, it may also reduce sweating in the face, armpits and the feet.

The goal of the surgery is to stop the sympathetic nervous system from sending signals to the hands. This is done by interrupting the sympathetic nerves that go to the hands and control the sweat glands. For most patients the results of the surgery are immediate and permanent. Sympathectomy has been a standard medical procedure for about 30 years. Recent advances in medicine have made it possible to do this procedure with small incisions done in the patient's armpits.

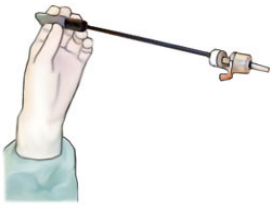
Some of these treatment options may not be covered by your health insurance. If you have health insurance, call your insurer to check if the treatment is covered.

Sympathectomy

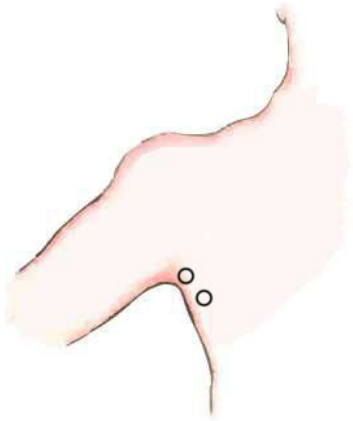
The goal of sympathectomy is to cut the sympathetic nerves that control the sweat glands of the hands. This is usually an outpatient procedure, which means you go home the same day. It is done under general anesthesia, which means you will be put in a deep sleep and feel no pain.

The doctor uses a scope that is inserted through a small incision. When a scope is used during the surgery it is called Endoscopic Thoracic Sympathectomy or ETS.

Your anesthesiologist will first administer the general anesthesia. You will have a breathing tube. The breathing tube is a special tube that allows the anesthesiologist to use only one lung for breathing while temporarily deflating the other. After you are asleep, the anesthesiologist deflates the lung on one side and the surgeon makes two small incisions in the armpit on that same side.



A small endoscope is then inserted through one of the incisions into the chest area. An endoscope is a medical device slightly larger than a beverage straw that has a camera connected at the end. It allows the doctor to see and zoom in on different body parts, tissues, and nerves.



First, the surgeon finds the sympathetic nerves along side the spine by using the endoscope. The surgeon will then go through the second incision and use an electric current to burn the nerve. This is a process called coagulation of the sympathetic chain and is usually performed at 2 to 3 locations.

The lung is reinflated on the first side and deflated on the other side. The same procedure is usually repeated for the other side of the body.

When the surgery is done, the lung is reinflated and the incisions are closed with the self-absorbing stitches.

Risks and Complications

Like any other surgical procedure, sympathectomy involves certain risks. Risks include those related to anesthesia, those related to surgery in general, and those specific to sympathectomy.

Side effects of general anesthesia include nausea, vomiting, problems with urination, cut lips, chipped teeth, sore throat, and headaches. More serious risks of general anesthesia include heart attacks, strokes, and pneumonia. Your anesthesiologist will discuss theses risks with you in more detail and ask you if you are allergic to certain medications.

Blood clots in the legs can occur due to inactivity during and after the surgery. These usually show up a few days after surgery. They cause the leg to swell and hurt.

Blood clots can become dislodged from the leg and go to the lungs where they will cause shortness of breath, chest pain and possibly death. It is extremely important to let your doctors know if any of these symptoms occur. Sometimes the shortness of breath can happen without warning. Getting out of bed shortly after surgery may help decrease the risk of blood clots in the legs.

Risks related to surgery include infection, bleeding, and skin scar. Infections and bleeding in sympathectomy are extremely rare. Skin scars are small due to the use of the endoscope and are close to the armpit area.

Risks that are specific to sympathectomy include compensatory sweating, gustatory sweating, decrease in heart rate, pneumothorax, and drooping eye.

Compensatory sweating means that the sweating that stopped in the hands can appear now in other body parts such as the chest and abdomen. Compensatory sweating will occur in most patients. In the majority of patients, compensatory sweating is mild, well tolerated and an acceptable alternative to severe palmar sweating.

Gustatory sweating is sweating that appears when eating or smelling certain foods. This side effect is rare after sympathectomy, but can still occur for some patients.

Some patients may experience a small decrease in heart rate. This is because the cut nerves also controls the heart beat. The decreased heart rate does not affect the person's cardiac health or abilities. The patient can still do the same exercises they did before the surgery.

Occasionally, a small amount of air is left inside the chest after reinflating the collapsed lung. This is referred to as a pneumothorax. The body absorbs this air within a few days and there are no long term side effects. During this period the patient is advised

not to travel because the air around the lungs may expand at high altitudes causing compression of the lungs and breathing problems.

If a pneumothorax causes lots of pain or breathing problems, the surgeon may decide to place a tube in the chest cavity outside the lungs. This tube is placed to suck out the leftover air. Such a tube is known as a chest tube. This tube is usually removed by the time the patient leaves the operating room. Occasionally it may have to be left in place overnight.

Other complications of sympathectomy include having a droopy eye. This is known as Horner's Syndrome. It is a rare complication. In very rare cases, there can also be a lack of facial sweating and a sluggish pupil.

Other extremely rare complications are injury to the organs inside the chest. These include arteries, veins, lungs and the heart. Injury to one of these organs may result in the surgeon having to perform a second surgery. This, however, is extremely rare.

After Surgery

The surgeon will see you immediately after surgery. You will feel some pain at the incision sites. A general discomfort in the chest area is also normal, and usually disappears in a day or two.

You may shower the next day. The stitches are beneath the skin and dissolve on their own. Most patients return to work within 24 to 48 hours after the procedure.

The surgeon may ask you to come by for a follow-up visit several days after surgery. Make sure to come to the appointment.

In most patients, the palms of the hands will no longer produce sweat. This is permanent. Some patients may no longer have any facial sweating or facial blushing. For few patients, it can also reduce hyperhidrosis of the feet.

Remember to follow these guidelines to control sweating in other parts of your body after the procedure:

1. Bathe daily and dry your feet thoroughly after you bathe.
2. Wear natural-fiber clothing and shoes made of natural materials such as leather.
3. Don't wear the same pair of shoes two days in a row.

4. Slip out of your shoes or go barefoot when you can, allowing air to reach your feet.

5. Apply anti-perspirant and deodorants to your armpits.

Conclusion

When the body sweats too much it is a medical condition known as hyperhidrosis. People who suffer from hyperhidrosis of the palms and do not respond to medications and non-surgical treatments can have a surgery called sympathectomy to permanently treat the condition.

The effects of sympathectomy are immediate. Most patients will have dry hands immediately after surgery. This procedure can also eliminate facial blushing and facial sweating for most patients. For some patients, it can also reduce hyperhidrosis of the feet.

Like any other surgical procedure, sympathectomy has certain risks. Knowing about them may help you detect and treat them early if they happen. Patients may have compensatory sweating after sympathectomy. However, most patients agree that it is an acceptable alternative to severe sweating on the palms of their hands.